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SATURDAY, AUGUST 21, 1920.

THE TIMBER CUT

It can be expected, according to the report of the forest service on timber depletion, that the lumber cut for the Pacific coast states, as a whole, will increase very materially during the next 10 years. "A gradual rise in logging costs is inevitable as the more accessible stands are cut and it becomes necessary to extend operations to the more mountainous logging chances. The timber resources of the Pacific coast states are very large, but it would be unwise to overestimate them, for much less than the total stand is readily available. Existing transportation facilities to the East are already overburdened with present traffic, and they will have to be very materially increased to meet the probable reduction in eastern and southern lumber cut during the next 10 years."

Although the Pacific coast states have large amounts of timber, the report points out that they will be called on to supply increasing amounts of lumber for the whole country. The danger is that, like other forested regions, they will be considered "inexhaustible," until it is too late. While the government has established a number of national forests in these states which are devoted to growing timber, other measures are necessary to prevent depletion of the Pacific coast forests. By following the plan adopted by the forest service of cutting in such a way that the forest is perpetuated, it is possible to avoid the destruction of forests that has taken place in New England the Lake States and the southern pine region, and to keep the land which is unfit for cultivation producing timber. As a first step, protection of the forests from fire by the government, states and private owners is essential, the report says.

BED OF RIVER WATER TIGHT

(Continued from Page 1.)

caused a partial loss of water between 20 and 50 feet. Through the solid upper or eastern basalt at 65 feet; reached the ground water at 75 feet, approximately 25 feet below the river level, and continued in it to the bottom of the hole, at 113 feet. This, also, is a good record. Especially significant is the discordance of water level in the hole and in the river, testifying, as it does, to the essential tightness of the river bed. In this connection it is important to note that the boring, connecting higher and lower levels in the ground, establishes an unfavorable condition that otherwise would not exist.

Weak Spot Found.

Hole No. 3 (1919 series), 50 feet deep; near the eastern flow line (4200 feet). No water lost above 11 feet nor below 40 feet, but between these depths the basalt (Columbia eastern) is seamy and the water escaped. The true ground water, or water table, was not reached, according to the record, although it is not quite clear that the water table is wanting below 40 feet. Evidently, however, our main reliance for the tightness of this part of the reservoir floor must be the packing of the seams of the basalt with the superficial clay soil.

Hole No. 4 (1919 series), 8 feet deep; half mile west of Big river, in section 13; western Columbia basalt. Water was reached at 7½ feet, about 12 feet below the proposed flow line, and a good flow obtained at 8 feet. This is evidently the true water table.

Hole No. 6 (1919 series), 22½ feet deep; the east side flow line, in basaltic sand and gravel. Water reached at 20 feet and bed-rock at 22½ feet. On the face of the record this boring represents a weak spot in the floor of the reservoir, and one that may well be more fully investigated. It is difficult in some cases to distinguish, by the drill cuttings, basalt and basalt gravel. The former would be the more favorable, and the latter has been named with a view to keeping the record conservative.

Hole No. 8 (1919 series), Brooks-Scanlon Lumber company; 100 feet deep; on the eastern flow of the Columbia basalt, and near the proposed flow line. This hole appears to pass through the great basalt into underlying volcanic ash and lapilli.

No water was lost above 27 feet, but at this depth a crevice was reached in which the drill water seeped away. At 37 feet this happened again. From 38 to 43 the hole held water, and at 45 withstood a pressure of 650 feet. From 70 to 80 the rock holds water well. At 95 feet the drill dropped from the solid lava into coarse, black sand and water, and the water rose in the hole about 6 feet, standing at 88 feet. At 97½ feet the drill was still in the black sand, in which there was a heavy flow of water. The lower and older (western) basalt was entered at 61 feet.

A review of the data thus far presented seems to lead to the conclusion that there is for the Benham falls district no fixed and definite water table, but we find, rather, a broad valley, with a series of irregular false bottoms, or levels, above each of which the water is in evidence, and below which it is lost, disappearing, in general, by horizontal more than by vertical flow. The main reliance, apparently, must be upon the integrity or impermeability of the surface soil, for it will have been noted that the water of the drill is seldom lost near the surface. The clayey soil is efficient as a blanket over the surface, and more especially as a filling of the joints and seams adjacent to the surface.

Probably both Spring river and Fall river issue from collapsed tunnels near the base of the old (western) Columbia basalt.

The preceding notes, which might be considerably or almost indefinitely extended, suffice to show that the immediate floor of the proposed reservoir consists, practically throughout, of impervious materials—diatomite, clay, silt, and other water-laid sediments; or, at least, that it embraces a sufficient amount of such materials, and of residuary clay, due to the decomposition of the basalt, volcanic ash, etc., to insure the water-tightness of the reservoir.

To begin with, or as a foundation for the reservoir, we have the great Columbia basalt—the older flow on the western slope and the newer flow on the eastern slope. This formation is abundantly stable and tight, except for the seams resulting from its prismatic joint structure, and these may be assumed to become tighter, if not fewer, with depth. Through this basalt, but chiefly through the older, weaker, western flow, the ancient Deschutes river cut its gorge, and, possibly, to a notable depth into the underlying detritus (ash and lapilli, sand and gravel), of highly permeable, water-bearing character, although the great rhyolite dike must have retarded the canyon making. At this juncture came the Lava butte eruption, effectively damming the Deschutes gorge in the latitude of the rhyolite dike and converting the upper gorge and basin into a natural reservoir or lake, in which, during the lapse of some thousands of years, have been deposited the sediments, largely of an impalpable character, which have completely sealed and practically obliterated the ancient gorge, and sealed, also, the adjacent valley floor to the upper limit of its flooding. What the exact elevation of this early flow line may have been is not readily determined, but it could hardly have been less than the original elevation of Benham falls. Subsequent erosion has, no doubt, removed this mantle, in large part, from the higher and steeper slopes, but over the broad bottom it exists almost intact to the extreme head of the prospective reservoir. It is most likely to be deficient on the upper lateral slopes near the lower or downstream end of the basin, and it was largely in the hope of strengthening the evidence in this part of the field that the ground water observations were made. It is here that rock outcrops are most in evidence, but we look in vain for any noteworthy developments of pressure ridges, fissures, or other indications of structural weakness and probable leakage. An especially favorable fact is the absence from the entire area of the proposed reservoir of volcanic vents, with their baleful radiating fissures, Lava butte and Bates butte being the only vents that are even approximately included.

To summarize: The buried Deschutes gorge, above the upper limit of its closing by the Lava butte flow, may be regarded as absolutely sealed and proof against leakage, even under the head of a full reservoir, and the basalt floor of the valley, on either side of the ancient gorge, may be regarded with very nearly the same degree of confidence, its seams being, to a very large extent, covered and sealed by the lateral extension of the impervious sediments of the gorge and further sealed by the residuary soil resulting from the decomposition of the basalt and of volcanic ashes spread over it in successive eruptions.

The Dam Sites.

In view of all that precedes, a brief consideration of this important topic will suffice. The most cursory examination of the problem shows that the dam must tie to the rhyolite ridge for at least one of its abutments. The one chance to utilize the rhyolite for both abutments is to place the dam in the notch through which the river pours at the head of Benham falls. Here we have minimum length and height and the most ideal formation of the region for the entire foundation. This location is sure to appeal strongly to the new-comer, and it is withg reat reluctance that we abandon it for other and less ideal sites.

The chief objections to this site are: First, that a dam of adequate height for the desired storage would turn the impounded water over the new lava of the Lava butte flow, and it appears incredible that the lava can be either high enough or tight enough to meet the demand. Second, we know that the water of the Deschutes river is now stealing away from its open channel into the ancient channel filled with the "brick-bat" lava, and we cannot doubt that for the present, at least, the elevation of the water surface would increase this loss, although there is room to doubt whether, even under the head of a full reservoir, the loss would be serious, or a high percentage of the entire flow of the river.

One difficulty with this argument lies in the apparent fact that, since the river began to follow its present course, it has deepened the notch at the head of Benham falls by 30 and, possibly, by 40 feet. In other words, even with this greater head a sufficient amount of water went over the falls to accomplish this erosion since the Lava butte eruption.

Obviously, if this promising site is condemned, as apparently it must be, its rejection must rest mainly upon the fact that a dam 30 or 40 feet high would not give the requisite storage, and a higher dam, say 50 or 60 feet, would so far overtop the lava flow as to be, without question, absolutely hopeless.

Failing to get a dam with two rhyolite abutments, we proceed to pass in review the proposed sites having one rhyolite abutment. Proceeding upstream, we come first to site "B," above the abandoned bridge and on the extremity of the southern salient of the rhyolite ridge. The difficulties of this site are: First, the rhyolite salient is narrow, fissured and craggy, lacking the solidity of the Benham falls ledge. Second, the opposite or right bluff is the new lava, which here, also, is hopelessly lacking in elevation. Third, the old gorge is almost entirely filled with the shattered "brickbat" lava, into which the water of the river is visibly escaping, and it is extremely doubtful if a reasonably tight dam would be a possibility here.

Somewhat similar objections hold against dam site "D." The craggy rhyolite abutment is essentially the same. Being farther from the new lava, it is less in evidence, but the gorge is partly filled with the "brick-bat" type. The right bluff is the newer Columbia basalt, the same as at dam site "A", but some 20 feet lower in elevation.

At dam site "A" the rhyolite is solid and bold on the left and the newer Columbia basalt rises to the full height of the proposed flow line (4200 feet) on the right. Everything considered, "A" appears to be the most advantageous of all the suggested sites. By going farther upstream, we should lose in the elevation of the bluffs, first of the basalt and later of the rhyolite, and there could be no improvement in the bed of the river, since the borings show, as far upstream as they extend, that erosion has cut through the basalt. This is, quite certainly, a practicable dam site. But, lacking a rock bottom, it is not, evidently, adapted to a masonry dam, but rather to some type of earth dam.

(To be continued.)

Remarkable Menu.

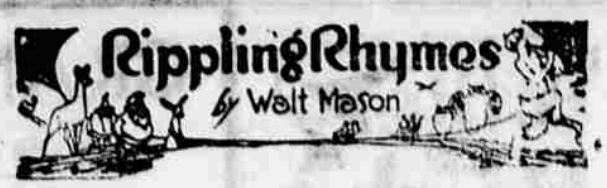
A group of New Yorkers dined the other day on some curious dishes. They were octopus soup, rock cod from New Zealand, roast breast of penguin, peas from Argentina, sea elephant cutlets and salads made from endives grown in Tasmania. All the fish and meats served at the meal had been frozen two years before in the south seas and were brought north to show how great and how varied a food supply the antarctic continent can furnish.—Youth's Companion.

Dimensions of a Million.

A way of realizing the meaning of a million, almost as good as counting chestnut blossoms, is to think of what it means in time. Few people realize that there are less than a million days in the whole Christian era; in fact, if we count back a million days from 1920 we come to a date well before the founding of Rome, while a million hours would take us back almost to the battle of Trafalgar.

Live bucking contests at Road Builders' picnic, Ten-Bar ranch, Sunday. You're invited. 63-65p

Wilson George Orchestra will give a series of dances at the gymnasium, beginning Wednesday night, Aug. 25. Tickets $1 and tax. Ladies complimentary.—Adv.



Woe In The West

A deadly blight is sweeping along the Western Slope, and men give way to weeping and say farewell to hope. And heartsick wives and daughters beneath those azure skies look out upon the waters with hard and stony eyes. The children, they are wailing, their little bosoms sore, while in the dust they're trailing the toys they use no more. There's moaning in the cabin, there's groaning in the hall; the future's bleak and drab in the eyes of one and all. The daughters of affliction are crouched beneath the stars, and in the choicest diction they cuss their stranded cars. The tourist shakes his talon at heaven with a snort, for when he'd buy a gallon he only gets a quart. In vain the plute is waving his wad of good long green, and futile is his raving—he can't get gasoline. "No gas!" The sign is hanging from stations everywhere, with travelers haranguing the dealers in despair. Talk not of grief or sorrow, of troubles you have seen, till you can't buy or borrow a quart of gasoline! Talk not of fortunes cruel, oh, vain and piffling man, till you can't buy the fuel to push your big sedan! Speak not to me of anguish, of pain of any sort, until you wait and languish two days to get a quart!